

11
November 26, 2003

OPP-2003-0248-0020

10/7

MEMORANDUM

Subject: Response to Registrant "Error Correction" Comments on the Preliminary Risk Assessment for Creosote

From: Tim Leighton, Environmental Scientist
Najm Shamim, Chemist
Kay Montague, Biologist
Jonathan Chen, Toxicologist
Tim McMahon, Toxicologist
Antimicrobials Division
Office of Pesticide Programs

To: OPP Public Docket for Creosote
Docket # 2003-0248

Introduction

This document addresses the registrants' error correction comments that were submitted on behalf of the Creosote Council in response to EPA's preliminary risk assessment (PRA) for creosote. Five "documents" or sets of comments were submitted to the Agency during the 30-day error correction comment step of the creosote RED process. The Creosote Council's comments are available in the docket. The vast majority of the comments do not address "technical errors" (e.g. *calculation errors*) but rather data/approach/methodology *interpretation errors*. EPA has responded to the specific errors, and where appropriate, have made modifications to methodologies. Other comments that were judged to be "interpretation" in nature will be reviewed after the public release of the PRA and any necessary changes will be made in the revised risk assessment.

General Comments and Responses

A summary of comments by the registrants are shown below, arranged according to discipline.

- **Use Profile:**

Comment: These comments include a list of creosote registrants including manufacturers and formulators.

EPA Response: EPA compared this list of registrants against the companies listed in the risk assessment and made the necessary changes.

- **Product Chemistry:**

Comment: These comments suggest that EPA placed too much emphasis on other data sources while “*clearly, the most relevant and well-controlled data set on creosote chemistry is the data set submitted by the Council,...*”. The author has issues with the listing of “relative percentages” of each component because this may not be a clear representation of the actual amount of each component. One “error” is presented by the author regarding data submitted for P1 – there is no AWP standard for P1.

EPA Response: The chapter includes data submitted by the industry (i.e., Creosote Council) and accepted by the Agency. In addition, the Agency also conducted a search for open literature data and has included those data in this chapter. The Agency reported the open literature values ‘as is’, and did not seek any changes in the reported values. Change in the ‘relative percentages’ would not change any assessment of the properties of the substances. Additionally, the physical/chemical characteristics of various components of creosote are included in the chapter as these data are useful in assessing fate, exposure, and toxicity of creosote. In clarification, the Agency did not imply that the AWP Method A1-91 is specifically for the P1 fraction. This method is for P1/P13 type of fractions.

- **Residue Chemistry:**

Comment: No issues were raised with this chapter.

- **Incidents:**

Comment: The comment was made that incidents have not been authenticated by EPA and that the chapter on human health effects should characterize these reports as such.

EPA Response: The summary of incidents are reported from the literature and are peer-reviewed and in many cases well documented. Some cases are not fully confirmed with documented evidence of exposure, although most have physician-diagnosis and therefore have documented effects. The reported pattern of effects and their consistency supply evidence supporting the overall risk assessment.

- **Review of Worker Exposure Study:**

Comment: Comments were made in response to the highlighted uncertainties in the PRA regarding the monitoring data from the worker exposure study. The commenter included clarifications to facilitate the review and understanding of the raw data (specifically the amount of creosote in each charge treated and the inhalation exposure calculations). Explanations are also provided as to why the inhalation results are reported as individual creosote components rather than relating these PAHs to total creosote. The commenter discussed the low and variable recovery values. Finally, there is mention that although EPA stated that there is less than the number of required field fortification samples, the number and types of field controls followed the EPA guidelines for exposure monitoring.

EPA Response: EPA will consider the clarifications to the study as background information. Otherwise, deficiencies can be found in most exposure studies, and as EPA has discussed, creosote is a complex compound to monitor and analyze. EPA, CDPR, and PMRA have noted shortcomings in the study but all have agreed that the data can, and should be, used in the risk assessment.

Comment: The following statements are also made: *“The view of EPA that inhalation exposure to creosote should be expressed as “total creosote” instead of components....is inappropriate....”* In addition, *“The Council takes exception to the use of benz(a)pyrene as an indicator of carcinogenic risk and naphthalene as an indicator of noncancer occupational risk for creosote.”* (Note: naphthalene is used for noncancer inhalation exposure assessment). Moreover, the author states, *“The use of individual PAH components of a mixture, or any individual component, as a surrogate for the mix is fraught with possibilities for mistake.”* Finally, EPA’s risk assessment mentions that there are “issues” with the analytical portion of the study but does not list them so no comments could be made by the author.

EPA Response: EPA’s view is that these components (i.e., naphthalene and BAP) are not used as “surrogates” such that we believe them to be inter-changeable with the creosote mixture. Instead, EPA uses them as indicators to identify that there are worker risk concerns when individuals are exposed creosote. The Agency is aware of publications examining the use of benzo(a)pyrene as an indicator of carcinogenesis for coal tar mixtures (Gaylor et al., 2000; Schneider et al., 2002), but recognizes that the data of Culp et al (1996, 1998) provide a data set for characterization of carcinogenic risk that are based on coal tar creosote and is thus more relevant to the issue. Therefore, in

4 of 7

accordance with the registrant's suggestion (Critique of USEPA's Creosote Human Risk Characterization, page 6, option #2), the Agency is examining these data for potential revision to the current approach in the risk assessment and will make any necessary changes to the revised risk assessment.

Comment: The representativeness of the PHED & CMA data for assessing non pressure uses of creosote is questionable. EPA should only focus on the pressure treatment exposure and omit the non pressure treatment assessment.

EPA Response: The non pressure treatment uses were deleted from the risk assessment because those uses have been requested to be voluntarily cancelled.

Comment: The risk assessment should be refined by changing the default values for 70 kg body weight, 250 days/year exposure frequency, 40 year working lifetime, and the 50 percent dermal absorption.

EPA Response: The standard values for body weight and working lifetime are based on OPP policy which has been scientifically peer reviewed. Additionally, any change in these assumptions have only a minor impact on the cancer risks. The Agency did not have a guideline study examining the dermal absorption of coal tar creosote. Using standard Agency policy, a dermal absorption value of 50% was estimated, based on the results of an oral developmental toxicity in rats and a 90-day dermal toxicity studies in the same species (rats) with similar endpoints (e.g., decrease in body weight gains). Benzo(a)pyrene has also shown a similar extent of in vivo dermal absorption (Ng et al., Toxicol. Appl. Pharmacol. 115: 216-223, 1992) and supports the use of the 50% value for creosote. There is not enough information from available in vitro data to adequately estimate dermal absorption of creosote. Further, the Agency does not currently accept in vitro studies as definitive evidence for the extent of dermal absorption but relies upon the 870.7600 guideline study for conduct of dermal absorption studies.

- **Toxicology:**

Comment: In summary, the author believes that because EPA did not call-in neurotoxicity studies that "...misleading statements [regarding neurotoxicity data gaps] should be deleted..." . In addition, the author challenges the Agency's positions on systemic toxicity, neurotoxic claims, and the interpretation of the developmental studies. Finally, more discussion is requested on the "deficiencies" noted by EPA on the reproductive toxicity study.

EPA Response: The wording in this section has been changed to reflect the fact that the data were not intended to be called in nor were neurotoxicity data identified as data gaps.

The neurotoxicity database on creosote has been examined and the compound has been characterized as showing no significant neurotoxic effects.

- **Human Exposure & Risk Characterization:**

Comment: The author contends that the risk assessment is “overly conservative” and should not use BAP and naphthalene. There are also specific remarks pertaining to implications to using language such as “lack of data”. The author believes that if a data call-in was not issued “*statements implying that creosote registrants have failed to submit required studies that EPA needs to complete certain assessments are false and misleading, and should be deleted.*” Issues are also raised on the use of naphthalene as an indicator along with using the EPA endpoint for naphthalene rather than the occupational standard (i.e., OSHA PEL). Finally, in the authors view, assessing non pressure treatment uses of creosote is irrelevant because EPA does not have chemical-specific data and the CMA and PHED data are not representative of this use.

EPA Response: As discussed previously, BAP and naphthalene are used by EPA to indicate that there are worker risk concerns and that the exposures should be mitigated. The document has been modified to remove that the lack of data implies that the registrants have failed to comply with a data call-in. The citations provided to EPA to potentially reduce the uncertainty factors for naphthalene will be reviewed and any appropriate modification will be incorporated into the revised risk assessment. Subsequent to the review of the last draft chapter, the non pressure treatments were requested to be voluntarily cancelled and the assessments of the non pressure treatments have been removed from the PRA. The Agency has used the endpoint for naphthalene rather than the OSHA PEL because the Agency conducts risk-based analyses which are solely health-based, compared to the OSHA PEL, which is a risk-benefit assessment.

Comments: A comment discusses the use of BAP and naphthalene as indicators and how they may be misleading. Supporting references on how they may over- or underestimate risks are provided. The author presents options and recommends developing a risk assessment with the creosote mixture. Unclear if it is a suggestion to develop toxicity studies using creosote or to use a surrogate approach cited in USEPA 2002 (i.e., workshop on PAHs). The BAP indicator approach is suggested to be best represented by “local tissue factors” and that we should use a concentration in the assessment (such as $\mu\text{g}/\text{cm}^2$ on skin) rather than an internal dose ($\text{mg}/\text{kg}/\text{day}$). The author recommends replacing the oral potency for BAP with an oral potency factor derived for creosote and cites Culp et al (1998).

EPA Response: The Agency is aware of recent publications examining the use of benzo(a)pyrene as an indicator of carcinogenesis for coal tar mixtures (Gaylor et al., 2000; Schneider et al., 2002), but is also aware of the data of Culp et al (1996, 1998) that reports on tumorigenic response to coal tar creosote itself and not individual components.

Therefore, consistent with the registrant's recommendation for revision of the cancer slope factor for creosote (Critique of USEPA's Creosote Human Risk Characterization, page 6, option #2). The Agency is examining these data for potential revision to the current approach in the risk assessment. The Agency recognizes the uncertainty in applying an oral slope factor to other routes of exposure but does not have any data to support changing the slope factor as currently published in IRIS.

Comment: The author noted the difference in the naphthalene endpoint/RfC and the ACGIH TLV. The author further provides an in-depth discussion of alternative approaches for reducing the uncertainty factors used by EPA for naphthalene.

EPA Response: The citations provided as alternatives to modify the uncertainty factors will be reviewed. However, EPA believes that its justification for the uncertainty factors selected are adequate.

- **Environmental/Ecological:**

Comment: The commenter had issues with the ecological assessment (e.g., needs a more in-depth review of the current literature, lack of data or failure to submit data in disagreement, inappropriate models used, etc.).

EPA Response: The original assessment has been revised to indicate that the Agency determined that the data requirements for ecological effects could be fulfilled by relying on published literature. It is also noted that the majority of literature data available at the time this assessment was conducted did not directly address guideline requirements, and therefore did not provide all of the appropriate endpoints for use in a quantitative assessment of ecological risk. The environmental risk assessment that was performed using these data indicated minimal risk from the use of creosote. There are uncertainties in this assessment, given the lack of suitable toxicity endpoints and exposure information, and there is also concern that creosote may be an endocrine-disrupting chemical. Creosote will therefore be given additional review once screening and testing protocols for endocrine disruption are finalized.

References

Culp, S.J., Gaylor, D.W., Sheldon, W.G., Goldstein, L.S., and Beland, F.A. (1996): DNA adduct measurements in relation to small intestine and forestomach tumor incidence during the chronic feeding of coal tar or benzo[a]pyrene to mice. *Polycyclic Aromatic Compounds* 11, 161-168.

Culp, S.J., Gaylor, D.W., Sheldon, W.G., Goldstein, L.S., and Beland, F.A. (1998): A comparison of the tumors induced by coal tar and benzo[a]pyrene in a 2-year bioassay. *Carcinogenesis* 19(1): 117-124.

Gaylor, D.W., Culp, S.J., Goldstein, L.S., and Beland, F.A. (2000): Cancer Risk Estimation for Mixtures of Coal Tars and Benzo[a]pyrene. *Risk Analysis* 20(1): 81-85.

Schneider, K., Roller, M., Kalberlah, F., and Schumacher-Wolz, U. (2002): Cancer Risk Assessment for Oral Exposure to PAH Mixtures. *J. Appl. Toxicol.* 22: 73-83.